

713
QUALIFICATIONS AND EXAMINATION OF CANDIDATES FOR
COMMISSIONS IN THE ARMY MEDICAL SERVICE

ORGANIZATION OF THE PRACTICAL ARMY
MEDICAL SCHOOL,

INCLUDING THE SUBJECTS TO BE TAUGHT BY THE PROFESSORS;

AND

RULES FOR THE EXAMINATION OF ASSISTANT-
SURGEONS PREVIOUS TO PROMOTION.



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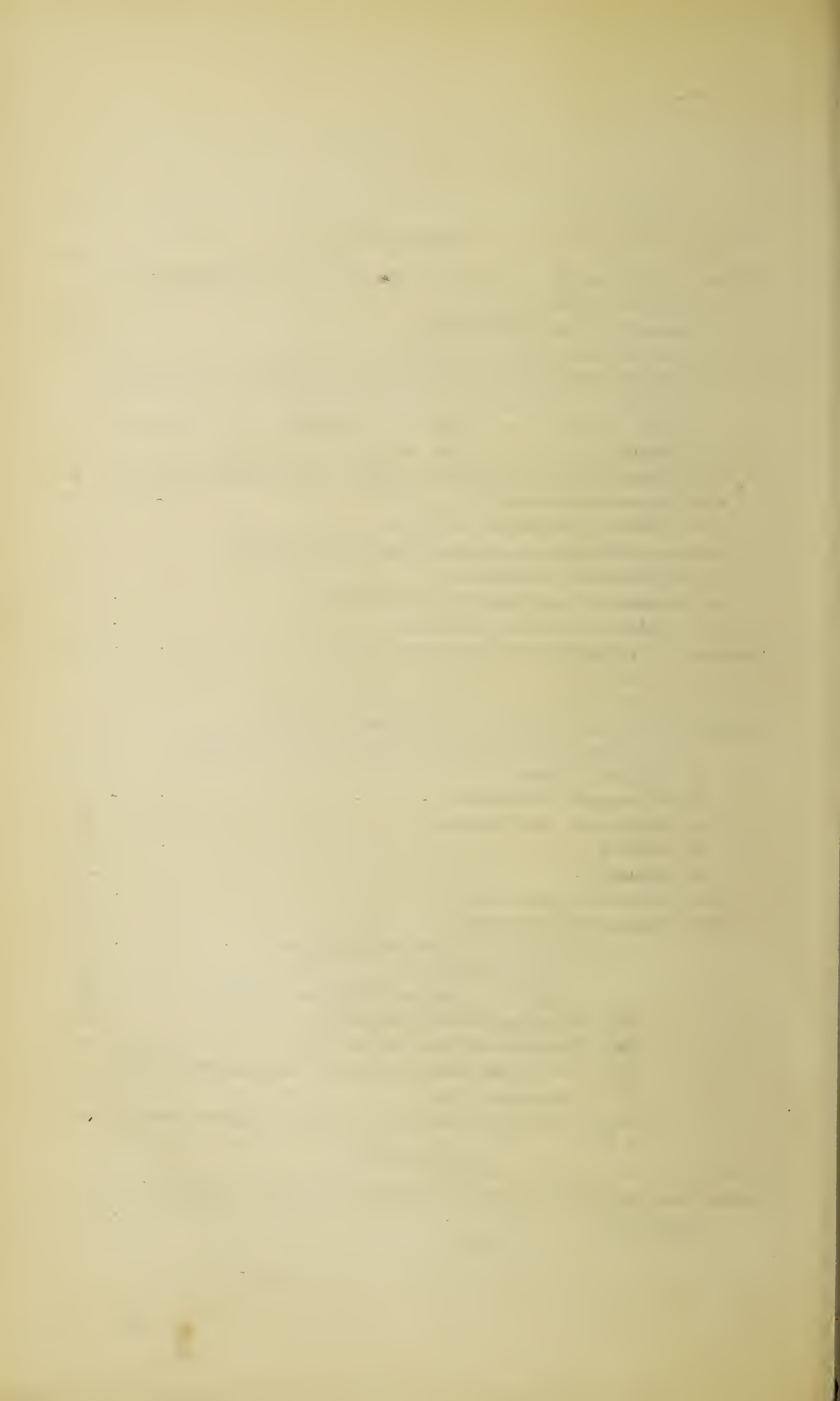
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Section I.

QUALIFICATIONS AND EXAMINATION OF CANDIDATES FOR COMMISSIONS IN THE ARMY MEDICAL SERVICE.

I.

EVERY Candidate presenting himself for admission to the competitive examination required for the Army Medical Service must be unmarried. He must produce a birth certificate from the District Registrar, or a certificate of baptism, in which the date of birth is stated. Or, if neither of these can be obtained, an affidavit from one of the parents or from some other near relative who can attest the date of birth, will be accepted. The certificate or affidavit must show that the Candidate is not above 26, nor under 21 years of age. He must also produce certificates of moral conduct and character, one of them from the parochial minister if possible.

Certificates.
Age of candidates.

II.

The Candidate must make a declaration that he labours under no mental or constitutional disease, nor any imperfection or disability that can interfere with the most efficient discharge of the duties of a Medical Officer in any climate. He must also attest his readiness to engage for general service immediately on being gazetted.

Declaration to be made by candidate.

III.

The Candidate must possess a diploma in surgery, or a licence to practise it, from the Royal College of Surgeons of England, Scotland, or Ireland; or from the Faculty of Physicians or Surgeons of Glasgow; or from some other corporate body legally entitled to grant a diploma in surgery or a licence to practise it. He must besides, and in addition to such diploma or licence, possess a legal qualification to practise medicine in Great Britain or Ireland.

Candidate must possess diploma or licence to practise surgery and medicine.

IV.

The Candidate, in addition to his Degree, Diploma, or Licence, the nature of which must be entered on the following

Degrees, diplomas, or licences and

certificates of attendance to be entered on the schedule.

Schedule, must transmit to the Director-General certificates of satisfactory attendance on all the courses of instruction required by the bodies from which he obtained his qualifications.

And he must enter in the Schedule a list of all certificates he can produce of hospital attendance and of attendance on Lectures or Courses of Practical Instruction which he has followed.

The following certificates will in all cases be required:—

- (1.) Of his having dissected the whole body once at least.
- (2.) A course of operative surgery, with a certificate of having performed all the great operations on the dead body.
- (3.) Three months' practical chemistry. The certificate must state that the pupil has conducted chemical analysis himself during the whole of that period.
- (4.) Three months' Natural History or Comparative Anatomy.
- (5.) Practical midwifery; a certificate of having attended 12 cases.
- (6.) Three months' Lectures on Ophthalmic Surgery.

Certificates of having attended the following courses of instruction are also recommended, but are not imperative:—

- 1 Course, Natural Philosophy.
- 1 „ Logic.
- 1 „ Dentistry.
- 1 „ Mathematics.
- French and German.

V.

Qualifications and certificates to be lodged a week before examination.

Degrees, Diplomas, Licences, Certificates, &c., must be lodged at the Army Medical Department for examination and registry at least one week before the Candidate appears for examination.

VI.

Subjects of examination.

On producing the foregoing qualifications and certificates the Candidate will be examined by the Examining Board on the following subjects:—

Anatomy and Physiology.

Surgery.

Medicine, including Therapeutics, the Diseases of Women and Children, Pharmacy, and the Laws of Health.

Natural History, including Zoology and Comparative Anatomy.

Botany.

Physical Geography, including Meteorology.

The subjects for the three last heads of this examination will be taken from the following books:—

- (1.) Carpenter's Zoology. Edited by W. S. Dallas, F.L.S.
- (2.) Rymer Jones' "Outlines of the Structure and Functions of the Animal Kingdom;" or, "Cours Elémentaire d'Histoire Naturelle," par Milne Edwards.
- (3.) Lindley's or Henfrey's "Elements of Botany."
- (4.) Somerville's "Physical Geography."
- (5.) Kemptz' "Treatise on Meteorology."
- (6.) Lyell's "Elementary Geology," or Page's "Advanced Text-book of Geology."

VII.

The Names of Candidates who pass the Preliminary Examination of the Examining Board, will be sent to the Director-General, and communicated to the Professors of the Army Medical School. The Names will be arranged in the following Classes:—

Classification of successful candidates.

CLASS I.

Names of those who have passed a pre-eminently distinguished examination, *arranged in their order of merit.*

Characters which distinguish the excellence of each. General estimate of individual capacity, or fitness for special service.

CLASS II.

Names of those who have passed a creditable examination, *arranged in alphabetical order.*

Statement of the topics in which each has individually excelled, and a general estimate of his individual capacity.

CLASS III.

Names of Candidates who have passed the MINIMUM examination, *arranged in alphabetical order.*

Statement of the particular branches of science in which each has been found to be DEFICIENT.

This information will enable the Professors of the Army Medical School to carry out their instructions with a definite aim as regards each Class.

VIII.

After passing his preliminary examination, every Candidate will be required to attend one entire course of practical instruction at the Army Medical School, before being admitted to his examination for a commission, on

Course of practical instruction at the Army Medical School.

- (1.) Hygiene.
- (2.) Clinical and Military Medicine.

- (3.) Clinical and Military Surgery.
 - (4.) Pathology of Diseases and Injuries incident to Military Service.
 - (5.) Applied Chemistry.
- These courses to be of not less than four months' duration.

IX.

Examination
for commission.

At their conclusion the Candidate will be required to pass an examination on the subjects taught in the school. The examination will be conducted by the Professors of the school.

The Director-General, or any Medical Officer deputed by him, may be present, and take part in the examination. If the Candidate give satisfactory evidence of being qualified for the practical duties of an Army Medical Officer, he will be eligible for a commission as Assistant Surgeon.

X.

Allowance to
candidates at
the medical
school.

During the period of his residence at the Army Medical School, each Candidate will receive an allowance of 5s. per diem with quarters, or 7s. per diem without quarters, to cover all costs of maintenance. And he will be required to provide himself with uniform, viz., the regulation undress uniform of an Assistant Surgeon, but without the sword.

XI.

Candidates to
conform to dis-
cipline.

All Candidates will be required to conform to such rules of discipline as the Senate may from time to time require.

SCHEDULE OF QUALIFICATIONS AND CERTIFICATES.

Recommended by_____

Christian and Surname
at full length.

I _____
_____ Years of Age, in _____ last, a Candidate
for employment in the Medical Department of the Army, do hereby
attest my readiness to engage for General Service, whether at Home
or Abroad, and to proceed on Duty immediately on being Gazetted.

I declare that I am unmarried, and that I labour under no Mental
nor Constitutional Disease, nor *any imperfection* or disability that
can interfere with the most efficient discharge of the Duties of a
Medical Officer in any Climate.

(Signature) _____

I have pursued the under-mentioned Course of Study, of which I
am ready to produce the Vouchers for Registry, and also a Certificate
of my Age ; namely—

I possess Certificates of regular attendance at the under-mentioned
Hospitals, and Courses of Lectures for the number of months stated :—

The	Hospital or Infirmary for	Months
The	Hospital for Mental Derangement for	Months
The	Hospital for Diseases of the Eye for	Months
The	Lying-in-Hospital for	Months

Stating the Number of
Lectures in each Course.

Lectures.	Professors' Names.	Place.	Period in Months.
Anatomy, by - - -			
Practical Anatomy, by - (stating the number of subjects dissected)			
Physiology, by - -			
Surgery, by - - -			
Clinical Surgery, by -			
Practice of Medicine, by ~			
Pathology, by - -			

	Lectures.	Professors' Names.	Place.	Period in Months.
<i>Stating the Number of Lectures in each Course.</i>	Clinical Lectures on the } Practice of Physic, by }			
	Chemistry, by - -			
	Practical Chemistry, by -			
	Botany, by - - -			
	Materia Medica, by -			
	Practical Pharmacy, by -			
	Comparative Anatomy, by			
	Natural History, by -			
	Midwifery, by - -			
	Practical Midwifery, by -			
	Ophthalmic Surgery, by -			
	Forensic Medicine, or } Medical Jurispru- } dence, by - - - }			
	Dentistry, by - - -			
	Natural Philosophy, by -			
	Logic, by - - -			
	Mathematics, by - -			

The Dates of Graduations and the Universities or Colleges are to be stated.

I have the Degree of A.M. or A.B. from the _____

I have the Degree of M.D. from the _____

I have a Licence to practise Medicine from the _____

I have a Diploma in Surgery from the _____

I have a Licence to practise Surgery from the _____

(Signature at full length) _____

(Date) _____

(Place of Residence) _____

Section II.

ORGANIZATION OF THE PRACTICAL ARMY MEDICAL SCHOOL.

I.

After passing his preliminary examination, every Candidate for a Medical Commission in the British and Indian Armies will be required to attend one entire course of practical instruction at the Army Medical School, and at the Military Hospital in connexion with it, on the subjects herein-after named, before being admitted to his examination for a Commission.

Candidates for commissions to attend course of instruction.

Cadets and Officers of the Royal Engineers and of the Indian Engineers may also attend a course of instructions on hygiène and a course of Chemistry.

Combatant officers will have the same privilege extended to them should they desire it. Army Medical Officers will also have access to the School.

II.

The special practical instruction which the school is intended to afford will be given by the following five professors :—

Subjects of course.

The Professor of Hygiène.

The Professor of Clinical and Military Medicine.

The Professor of Clinical and Military Surgery.

The Professor of Pathology.

The Professor of Chemistry.

III.

The school has a distinct and independent existence under the Secretary of State for War, and is governed by its own Senate, which will hold a meeting for the dispatch of business at least once a month or oftener if necessary.

Government of the school.

IV.

The Senate consists of the five Professors and the Director-General of the Army Medical Department, who will preside, when present, at the meetings of Senate; but only those members of Senate who may be present shall vote on the questions discussed.

The Senate. Its functions.

The Senate will regulate the routine business of the School.

It will decide on the arrangement, number, hours, &c., of the Lectures.

It will make and amend regulations for the conduct of the Students.

It will preserve discipline.

It will also have the regulation and direction of the Library, Museum, Model-room, and Laboratory; the selection of books, models, chemical and other apparatus necessary for the School, and will make up, and submit to the Secretary of State all estimates of expenditure connected with the School.

All acts of the Senate will be communicated to the Director-General.

No act of the Senate shall be binding until it has received the approval of the Secretary of State.

V.

Museum.

The Museum will consist of four divisions:—

1. A collection of Pathological Anatomy, having special reference to the more prevalent diseases of the Army.

2. A collection of Specimens of Geology and Natural History.

3. A collection of Materia Medica and Alimentaria, containing specimens of the more important articles, both in their natural and prepared states; and of the principal seeds, grains, pulses, and other dry or prepared articles of food, from all parts of the world.

4. A collection of plans and models of whatever is used in the Army for the conveyance, support, or protection of wounded men; models of tents, hospitals, and the like.

Classified Catalogues of the contents of these several divisions are to be kept.

VI.

Library.

The Library contains standard works in every branch of Medicine, and the allied sciences. Attached to the Library there is a Reading room, properly furnished with maps, books of prints, &c., to be kept in the Library, but the Pupils will have permission, under the regulations of the Senate, to take books to their own quarters.

VII.

Length of session.

The business of the session will be arranged by the Senate, in such manner that there shall be at least six months' residence at the School and Hospital, including courses of not less than four months instruction by lectures, &c.; so that there shall be two sets of Candidates ready for examination for commissions every year.

VIII.

The Lectures and Practical Instructions to be delivered at the School will be directed exclusively to the specialties of the Military Medical Service. Nature of the instruction.

The Courses of Lectures will include the subjects in the following five programmes arranged in such order and manner as the Senate may from time to time decide.

I.

HYGIÈNE.

The Course of Lectures and Instructions in Hygiène should be directed to impress forcibly on the mind of the student the whole principles on which the prevention of disease is based, not only in their scientific but in their practical aspect, and from thence to follow out the application of those principles to the preservation of the health of troops in Barracks, Hospitals, Garrisons, Stations, Camps, and on Marches, both by practical instruction in the problems of Army hygiène, and by reference to maps, diagrams, models, instruments, and other methods of illustration. LECTURES AND INSTRUCTIONS ON HYGIENE.

PART I.—*Principles of Hygiène.*

Hygiène, its nature, importance, historical notices of, objects as regards civil populations and armies.

Literature.

Ancient legislation on this subject.

General statement of physiological laws relating to health and disease. PART I.
HYGIENE,
PRINCIPLES.
Nature and importance.

Influence of age, sex, temperament.

Influence of trades and occupations.

Longevity.

External conditions upon which health depends, considered in relation to individuals and communities. Physiological laws relating to health.

Comparative healthiness of different races.

Physical and mental qualities of different races, influencing their fitness for military service. Conditions on which health depends.

Examination of external conditions and the effect of these on health and life. External conditions as to climate, &c.

General sketch of the meteorology of the different zones.

Effect of temperature on health and longevity: and of sun heat, season, moisture, droughts, rains, winds, calms, storms,

day, night, light, darkness, electricity, apparent lunar influence in tropical climates.

Sun-stroke, snow blindness, day and night blindness.

METEOROLOGY. Meteorology: its importance in the science of hygiène.

Manner of making and keeping meteorological observations.

Barometer.

Sun thermometer.

Maximum and minimum thermometer.

Wet and dry bulb.

Rain gauge.

Electrometer.

Anemometer.

Clouds. Snow. Hail.

Ozone papers.

Reduction of observations.

Description of climates.

Effect of different climates on health.

Influence of light and of sun radiation on health.

Beneficial effect, or the reverse, of change of climate, and precautions required.

Acclimatization.

Positions occupied by the human race on the Earth's surface.

PHYSICAL GEOGRAPHY. Physical Geography. General sketch of the Earth's surface. Land. Water. Mountains. Hills. Plains. Plateaux. Deserts. Valleys. The sea. Rivers. Lakes. Proportions of land and water. Natural drainage. Marshes and marshy ground.

Vegetation. Forests. Jungles. Brushwood.

General geological sketches of the Earth's surface. Stratification. Formations. Surface soils. Subsoils.

Physical geography and medical topography of the British islands, colonies, and possessions.

MEDICAL TOPOGRAPHY. Medical topography of countries where great military operations have been carried on.

Geographical distribution of disease and mortality over the surface of the Earth in relation to the physical geography of different countries.

Sketch of external conditions influencing the geographical distribution of disease, such as climate, elevation, marsh and subsoil miasm; miasm from river and lake banks, and stagnant waters. Salt marshes. Salt and fresh water marshes. Sea coasts. Defective natural drainage, irrigation, heavy rains, damp and stagnant air, and mists in plains, valleys, hollows, forests, jungles, rapid changes of temperature, decomposing organic matter, &c.

Effect on health of the use of marsh water, river water, stagnant waters, shallow and deep well waters, brackish waters, mineral waters.

Diseases produced or aggravated by the use of water containing organic matter in a state of putrefaction.

Influence of elevation above or below the sea-level on health.

Beneficial effects of change of elevation.

Sanitaria. Rules for selecting them.

Rules for selecting military stations.

Medical topography of mountain ranges in our foreign possessions, including the history of mountain climates. Advantages of mountain climates in tropical countries.

Sanitary advantages of such climates in our intertropical possessions. Necessity of establishing European troops in the hill ranges of our intertropical possessions. Advantages of solitary mountains.

Meteorology of mountain ranges, specifying the different phenomena and their influences on health at different degrees of elevation.

Causes of the greater healthiness of certain geological formations than of others.

Effect of emanations from putrescent animal matter on health. Emanations from excreta: from the skin: from the lungs. Effects of miasmata from putrescent animal matter.

Illustrations of the production of speedy death by such emanations; also of plague, gaol fever, typhus, &c.

Diseases arising from marsh miasm, intermittent, remittent, and tropical bilious fevers, yellow fever, &c. Diseases arising from marsh miasm.

Diseases aggravated by emanations from putrescent animal matter. Diseases from putrescent organic matter.

Plague, and fevers of the continued type. Typhus, cholera, diarrhœa, and dysentery, ophthalmia, phthisis, carbuncle, "Pustule Maligne."

Sources of putrescent organic effluvia.

Overcrowding of the population on a given area. Illustrative examples of this in civil life and in the Army. Sources of putrescent organic effluvia.

Relation of disease and mortality to surface overcrowding. Surface overcrowding.

Effect of surface overcrowding during epidemics, in increasing their intensity.

Beneficial effect of spreading the population during epidemics.

Influence of defective surface and subsoil drainage, in predisposing to epidemics, with illustrations. Defective drainage.

Similar illustrations from defective or deficient drainage in towns and buildings.

Fatal effects of sewer air diffused through the atmosphere of towns and buildings.

Miasmata from nuisances, unwholesome manufactories, cesspools, sewers, accumulations of decaying refuse, unburied carcasses, and offal, dead bodies, and overcharged grave-yards. Putrescent organic matter.

Defective burial of the dead. Burial in churches, or under habitations. Illustrations of their influence on health, and in predisposing to epidemic disease.

Overcrowding
in cubic space.

Influence of overcrowding in cubic space in the production of disease, especially during epidemic seasons.

Amount of cubic space and superficial area requisite for health in barracks, huts, tents, hospitals, and ships.

Principles on which the amount of cubic space should be determined.

Ventilation.

Ventilation.

Sources of atmospheric impurity in unventilated dwellings from respiration, carbonic acid, animal exhalations from the skin and lungs. Effluvia from foundations of buildings: from fires, lights, cooking, stables, under or near buildings.

Inquiry as to their effects, especially during epidemic seasons, with illustrative examples, taken from the Army and from civil life.

What constitutes good ventilation.

Discussion as to the quantity of air required.

Simple methods of ventilation in use, with models and plans.

Natural ventilation, artificial ventilation, their relative advantages.

DIET.

Relation of diet to health.

Animal diet.

List of dietetic substances, animal and vegetable.

General account of the classes of animals from which dietetic substances are derived.

Geographical distribution of animals.

Classes of animals fit for food to be obtained in different countries.

Comparative nutritive value of beef, mutton, pork, veal, fish; when fresh, dried, salted, smoked: also of cheese, milk, eggs.

Chemical analysis of different kinds of animal food.

Marks of health and disease in animals. Signs of fitness or unfitness for food.

Sanitary precautions to be adopted on board transports for animals.

Diseases, deterioration of flesh and loss of animals arising from neglect of these precautions, and probable injury to the troops in consequence.

Signs of wholesome and unwholesome meat.

Diseases arising from the use of unwholesome or badly prepared flesh or fish.

Cooking.

Different forms of cooking apparatus and utensils.

Cooking, stewing, boiling, roasting, frying, baking.

Benefits to health of change in the mode of preparing food.

Cereals.

List of grains used for food.

Their geographical distribution.

Wheat, oats, barley, maize, rye, millet, rice, &c., their generic and specific characters.

Chemical composition.

Comparative nutritive value.

Signs of wholesome and unwholesome grain.

Diseases arising from the use of unwholesome grains.

Ergotism.

Signs of good, bad, and adulterated flour.

Microscopic characters. Deterioration by insects.

Preparation of grains for food. Biscuit. Bread. Cake. Baking.

Preparation of biscuit. Its constituents. Its nutritive value. Under what circumstances it may become injurious to health.

Bread, its constituents and manner of preparation. Yeast and its substitutes. Characters of wholesome bread. Field ovens.

Methods of preparing maize flour as food.

Bulbs, tubers, roots used as food. Potatoes, carrots, oots. turnips, onions, leeks, &c.

Chemical composition.

Nutritive qualities.

Preparation for use.

Distinguishing characters of wholesome and poisonous roots.

Green vegetables. List of plants used as such.

Vegetables.

Their geographical distribution.

Dried vegetables. Constituents. Mode of preparation and preservation.

Peas, beans, haricots. Nutritive value. Chemical constitution. Mode of cooking.

Sugar and Saccharine matter. Nutritive value.

Sugar.

Condiments. Mustard, pepper, salt. Their use and abuse. Condiments.

Materials used for hospital diets.

Hospital Diets.

Drinks. Water. Daily quantity per man required for drink, cooking, washing.

DRINKS.

Physical tests of pure water. Rain water, its composition and qualities.

Chemical substances dissolved in water.

Hardness and softness, their tests and nomenclature.

Saline ingredients. Calcareous, organic, and metallic ingredients. Their effects on the purity and wholesomeness of water.

Sources of water. Rain, springs, streams, rivers, lakes, wells, ponds, marshes.

Diseases produced or aggravated by impure water :

Diseases from impure water.

Fever, cholera, diarrhœa, dysentery, dracunculus, &c.

Mode of action of impure water in producing disease.

Methods of purifying, collecting, storing, and distributing water. Storing and purifying water, &c.

Subsidence, filtration, boiling, distillation, chemical purification.

Collecting by superficial drains, by earthenware, metal, or wooden pipes. Necessity of guarding water sources and wells. Covering reservoirs. Precautions in distributing water to prevent pollution.

Supply of water for animals.

Tea, Coffee, &c. Tea, coffee, cocoa. Their chemical composition, dietetic properties, utility in repairing waste.

Wines. Wines. Kinds, qualities, geographical distribution. Wines obtainable in different countries.

Their healthiness or unhealthiness.

Adulterations, and the manner of detecting them.

Spirits. Spirits. Rum, brandy, whisky, arrack.

Adulterations, and the means of detecting them.

Influence of spirit drinking on health.

Malt Liquors. Malt liquors. Their chemical and dietetic qualities.

Vinegar, lime-juice, acids. Their properties and uses in dietetics.

Adulterations.

Clothing, Accoutrements, Composition, &c. Clothing. Its weight, material, colour. Conducting or non-conducting power for heat. Also the fitting of clothes to allow free play to the muscles and internal organs.

Accoutrements. Their nature, weight. Influence on health.

Clothing for different countries, climates, and seasons. Its essential parts for health, and their composition. Waterproof materials. Stock. Head-dress. Boots and shoes, their kind and quality. Precautions in manufacture required to prevent foot lameness.

General Resumé. General resumé of the conditions necessary to health already discussed. Limits within which these conditions may be imperfectly fulfilled without producing disease.

Operation of neglect of Hygiène in causing disease. Operation of neglect of hygiène on the human organism in causing disease, or in predisposing to it, in different climates, ages, sexes, temperaments, and civilizations.

Great differences in the amount of disease and mortality existing in different countries.

Statistical facts to prove this. Differences among town and country populations in the same country.

VITAL STATISTICS. Vital statistics. Their foundation. Method of collecting facts.

Structure of tables and diagrams.

Tables exhibiting the leading facts of comparative vital statistics referring to the health of countries, districts, cities, and towns, sex, age, occupation.

Examination into the causes of mortality.

Diseases which influence mortality to the greatest extent. Importance and necessity of a common nomenclature of diseases.

Nomenclature. Explanation of the nomenclature. Importance also of one classification for the public service.

Prominence due to zymotic diseases in all classifications. Their importance to civilization. Their especial importance in armies.

Epidemiology. Importance of this branch of science.

Epidemiology.

Laws of epidemics.

Localizing conditions of epidemics.

Predisposing effects of season, bad and unwholesome food, deficient clothing, misery.

Mediæval epidemics. Plague, black death, sweating sickness.

Account of the conditions under which these diseases desolated Europe and Asia. Facts as to predisposing conditions that have come down to us.

Modern epidemics, plague, cholera, yellow-fever, typhus, small pox.

Transmissibility of disease. Inoculation, vaccination, re-vaccination. Illustrative examples of the mitigation and extirpation of epidemic diseases by sanitary measures.

Transmissibility of disease.

Advantage of treating zymotic diseases, especially cholera, in their early stages.

Sanitary measures. Earliest records of their use for preserving health, and preventing epidemics among Egyptians, Hebrews, Greeks, Romans, &c.

Sanitary measures and legislation.

Sanitary legislation.

Authorities, Officers of Health, and Inspectors, their duties and usefulness.

General organization of sanitary police in towns.

Detailed account of recent sanitary improvements introduced into towns, buildings, and country districts.

Drainage, its object and principles. Formation and construction of sewers and drains. Trapping, ventilation, flushing of sewers and drains. Various forms of soil-pans, water-latrines, urinals.

Cleansing and preventing nuisances.

Paving. Its great utility as a means of preventing disease, with illustrations.

Limewashing of houses. Its *modus operandi* and beneficial effects in checking epidemic disease.

Baths, ablution rooms, and wash-houses. Their arrangement and construction.

Instances of improved health from sanitary works.

Improved health.

Improved towns.

Model lodging-houses.

Requisites for healthy buildings.

Hygiène as applied to the treatment of disease.

Hygiène as applied to treatment of disease.

Pure air and pure water the prime requisites in all Hospitals.

Hygiène of Hospitals.

Beneficial influence of light on disease.

Amount of window space in relation to cubic contents of wards.

Cleanliness.

Removal of excreta.

PART II.
ARMY HYGIENE.

MILITARY
VITAL
STATISTICS.

PART II.—*Application of Hygiène to Armies*

Military Vital Statistics.

Army ages.

Mortality due to Army ages in civil life.

Mortality in the Army.

Inquiry as to its amount.

Sanitary condition of civil population out of which the Army is selected.

Process of selecting recruits and proportion of recruits rejected, and for what diseases.

Effect of this on the vital statistics of the Army and of civil life.

Invaliding, its amount at different ages. Causes of invaliding. Deaths amongst invalids.

Actual Army mortality, and comparison with that of civil life.

Mortality of
Foreign Armies.

Mortality of different foreign armies. Comparison with that of the British Army.

Mortality in
different Arms.

Mortality in different branches and arms of the service, Household Troops, Foot Guards, Cavalry of the Line, Infantry of the Line, Artillery, Engineers, Sappers and Miners, Land Transport, Colonial Corps, black and white troops.

Comparative
Mortality in
different Colo-
nies and Posses-
sions.

Comparative mortality of troops on home and foreign service.

Comparative mortality in different Colonies and Possessions.

India, Ceylon, Hong Kong.

Africa, Cape.

West Indies.

Mediterranean.

Canada.

Australia.

Mortality in War, Peninsula, Walcheren, Scutari, Crimea, Napoleon's Russian Campaign.

Causes of high
Mortality in
Armies,
Zymotic
Diseases.

Examination as to the diseases which occasion the high rate of Army mortality. Zymotic diseases.

Effect of zymotic diseases on the mortality of armies as compared with diseases of other classes.

Diseases of
different
Colonies and
Stations.

Diseases incident to different Colonies and Stations:—India, West Indies, Ceylon, Cape, Mediterranean, Bermuda, Canada.

Percentage of sick in Armies, and from what diseases.

Sick in Armies.

Historical sketch of Army epidemics.

ARMY EPI-
DEMICS.

Yellow fever, Army typhus, remittents, intermittents, continued fevers, dysentery, plague, cholera, diarrhœa, scorbutus, ophthalmia.

Local and personal conditions with which they are usually connected.

Conditions under which any epidemic may be anticipated.

Epidemic influence. Signs of its approach. Effect on other diseases.

Yellow Fever. Temperature and latitude under which it exists. Yellow fever zones. Account of Army yellow fever epidemics. Barbadoes, Jamaica, Gibraltar, Bermuda, Trinidad, &c. Yellow Fever.

Their history, origin, mode of propagation. Statistics.

Sanitary defects in Stations, Barracks, Garrisons, and Hospitals with which they have been connected.

Loss to the Army from them.

Sanitary improvements already carried out to diminish their intensity.

What preventive measures are further required.

Army Typhus. Nature of the disease. Causes. Influence of sanitary defects in predisposing to it, with illustrations. Army Typhus.

Sanitary and other prophylactic measures required to prevent it.

Remittent Fevers. Their relation to yellow fever. Remittent

Their origin. Local favouring conditions. Personal predisposing causes. Parts of the globe where they occur. Facts connected with their occurrence. Influence of marsh malaria and decomposing vegetable matter under high temperature. Fevers.

Sanitary and other prophylactic measures required for their mitigation.

Intermittents. Influence of malaria, extremes of heat and cold, exposure to night air, &c. Intermittents.

Prophylactic and sanitary measures required for their mitigation.

Continued Fevers, their local favouring conditions. Continued

Influence of damp, overcrowding, defective ventilation. Fevers.

Prophylaxis.

Dysentery. Types of the disease. Dysentery.

Predisposing causes from filthy camps, bad water, monotonous or unwholesome diet, exposure to extremes of heat and cold, night air, &c.

Sanitary and prophylactic measures required.

Plague. Instances of its appearance in armies, and the conditions under which it has shown itself. Plague.

Sanitary state of towns and districts visited by plague.

Prophylactic measures.

Cholera. First appearance of Asiatic cholera in 1817. History, progress. Subsequent epidemics in India, Europe, America. Cholera.

Local and personal conditions under which cholera is most fatal. Bad water, overcrowding, defective ventilation, malaria, fatigue, filth, drunkenness, &c. Premonitory diarrhœa.

Precautions against Cholera. Evacuating affected Barracks and Hospitals. Camping out. Shifting camps, reducing overcrowding, ventilating, lime-washing, cleansing, spreading Precautions against Cholera.

the men on march. Avoiding bad camping ground on march. Spreading the troops. Short marches. Avoiding fatigue. Regulation of latrines.

Great importance of inspection for the discovery of premonitory diarrhœa.

Scorbutus.

Scorbutus. Importance of to armies.

Causes, influence of salt provisions, monotonous diet, want of vegetables, damp, exposure, foul air, other concurrent causes.

Prevention, rations, vegetables, and vegetable acids, lime-juice, lemon-juice, vinegar, acid fruits, vegetables. General attention to hygiene.

Ophthalmia.

Ophthalmia. Its great importance in armies.

Predisposing conditions, sunlight, dryness of air, dust, defective ventilation and overcrowding, want of personal cleanliness, bad habits, intentional communication of the disease.

Preventive measures against ophthalmia.

Phthisis Pulmonalis.

Phthisis pulmonalis. Its predisposing causes in barracks.

Necessary sanitary measures.

Farunculus, sun-stroke, frost-bite.

Foot lameness, its causes, importance of prevention.

Syphilis.

Syphilis, its importance in armies.

Prophylaxis of syphilis.

Prevention of parasitic diseases.

PRACTICE OF
ARMY
HYGIENE.

Enlistment.

Enlistment.

Examination of recruits. Signs of health, of disease, of constitutional defects. General appearance, height, weight, development of chest, abdomen, spine, muscular development. Spirometer. Dynamometer. Marks of medical or surgical treatment. Stethoscopic examination. Pulse, heart, tongue. Eye, hearing, voice, form of feet and hands, skin, glands, marks of vaccination, &c.

Defects rendering recruits unfit for service.

Feigned and simulated diseases.

Explanation of instructions for examining recruits. Great importance of selecting only the best men for service, and the injury to the service of admitting weak and unhealthy men.

Training Exercises.

Training. Drills, exercises.

Gymnastics.

Games, gymnastics, their nature, and importance in developing different sets of muscles, of respiration, walking, running, arms, &c.

Gymnastic apparatus.

Classification of exercises.

Injurious gymnastic exercises and accidents that may arise from them, and precautions.

Practical importance of gymnastics in improving health and increasing the agility and muscular power of the soldier.

Personal cleanliness.
Baths, &c.

Functions of the skin in preserving health.

Personal cleanliness, washing, bathing, different kinds of

baths, bathing parades, hygiènic rules and precautions in respect to bathing in different climates and seasons.

Prevention of cutaneous diseases. Scabies.

Prevention of diseases of scalp.

Construction of lavatories. Substitutes on field service.

Washing clothes on field service.

Stations. Selection of sites for buildings in different climates, Stations. with reference to elevation, exposure, configuration of ground, marshes, natural drainage, nature of surface and subsoil, water supply. Changes of station. Clearing away vegetation.

Plans and constructions of barracks. Foundations of Plans and construction of Barracks. buildings for warm climates. Drainage of site.

Materials for building.

Arrangement of rooms and staircases to secure independent ventilation of every part of the building.

Size and proportions of barrack rooms.

Cubic space per man in different climates and seasons, and during epidemics.

Means of ventilation and warming.

Amount of window space.

Means of lighting.

Limewashing.

Materials for walls, ceilings, and floors.

Cleansing floors, furniture, bedsteads, bedding.

Latrines and urinals, their structure.

Drainage. Drains not to pass under buildings, and why?

Hygiène of barrack-rooms.

Hygiène of Barracks.

State of the air in unventilated barrack-rooms at night.

Ventilation during night.

Chest diseases produced by neglect of night ventilation.

Methods of ventilation.

Cleanliness.

Objections to basement barrack-rooms.

Barrack kitchens, their structure for various kinds of cooking. Necessary utensils. Boilers. Soyer's stove. Open fire-places. Ovens. Gas ovens. Economy of fuel.

Cavalry barracks. Special sanitary precautions regarding them. Position of stables. Arching of stables. Independent ventilation of stables. Cleansing. Drainage. Removal of manure.

Selection of existing buildings to be occupied as barracks. Selection of Buildings. Their position, neighbourhood, drainage, structure, cleansing, ventilating. Allotment of cubic space. Limewashing. Provision of latrines. Selection of quarters. Billeting of troops. Nature of the sanitary precautions and works required.

Sanitary inspections, and reports on barracks. Points to be examined into.

Garrisons. General sanitary police. Drainage. Cleansing. Garrisons. Hygiène of buildings. Casemates, their construction. Their sanitary defects in want of light and ventilation, Special

sanitary precautions required in regard to them, whether used as barracks or as hospitals.

Special sanitary precautions in respect to occupied towns during war.

Duties of Quartermaster-General's Department in respect of buildings, stations, camps, marches.

Duties of Medical Officers under the regulations.

Inspection of towns as to vicinity, position, drainage, cleanliness, population. Water supply.

Sanitary Police. Organization and duties of sanitary police.

Selection of buildings for quarters and hospitals.

Precautions against epidemic disease in occupied towns. Cleansing. Drainage. Removal of Nuisances, &c.

Seaports in occupation. Special sanitary precautions in regard to them. Harbour police. Co-operation of military and naval authorities in preserving the health of seaports.

Sanitary regulations and works for occupied towns and seaports.

Hygiène of
Hospitals.

Selection of sites for Hospitals.

Exposure

Locality.

Vicinity.

Composition of surface and subsoil. Natural drainage.

Plan of hospitals.

Discussion as to advantages and disadvantages of different plans for sanitary and administrative objects.

Great principle in hospital construction to break up the sick into small numbers under separate roofs.

Number of flats.

Size of wards for administration and salubrity.

Number and position of windows. Windows should be on opposite sides of ward.

No more than two rows of beds in a ward.

Amount of light required in hospitals.

Illustrations of good and bad hospital construction.

Advantages of recent French improvements.

Ventilation of hospitals. Various methods. Artificial, by extraction: by injection of air. Natural, by doors, windows, and fire-places. Best methods of natural ventilation. Their comparative facility, and advantages in securing freshness of the air. Amount of air which can be admitted by natural methods.

Quantity of air requisite for sick. Usefulness of artificial ventilation in defective hospital construction.

Hospital water-closets. Their structure, position, and ventilation.

Cubic space for sick in different climates. Distance of beds

Warming of hospitals. Advantages of open fire-places. Their great ventilating power. Radiant heat best for warming, and why?

Walls and floors of hospitals should be of impervious materials.

Position of nurses' and orderlies' rooms.

Ward furniture and bedding.

Water supply of hospitals.

Baths, cold, hot, vapour, shower, medicated. 'Their structure and position with respect to wards.

Hygiènic uses of baths.

Best structure of hospital kitchens.

Hospital cooking and diets.

Diet rolls and tables. Analysis of diets. Explanation and use of diet tables.

Examination and selection of buildings for hospital purposes. Selection of

Points requiring special inquiry. Position. Drainage. Building for
Ventilation. Cleanliness. Amount of accommodation. Temporary
Hospitals.

Adaptation of buildings. Improvements and works necessary to remove defects.

Instances of disastrous results from sanitary neglects in hospital buildings.

Preliminary inquiries before troops take the field as to Hygiène of
physical geography. Medical topography. Climate. Supplies. Camps.
Numbers, and habits, and diet of the population. Houses,
&c. Prevalent epidemics and diseases.

Manner of conducting inquiries. Subjects of inquiry.
Reports. Precautions founded on reports.

Preliminary examination of country. Selection of camp sites.

Marks of positions favourable or unfavourable to health.
Examination of vicinity, of surface and subsoil, of drainage,
woods, vegetation, products, waters, prevailing winds.

Sanitary reports to Quartermaster-General on these points.

Methods of improving positions by drainage, cutting down
timber and brushwood, &c.

Details of sanitary inspection of camps.

Arrangement of camp.

Arrangement
of Camps.

Order and distance of tents best adapted for health.

Estimate of the number of men on a given area in different
forms of camp. Importance of the question as regards health.

Drainage of camp sites, on hillsides, slopes, and flats. Drainage of
Nature of drainage required in different inclinations of Camps.
ground and in different soils.

Water supply of camps. Estimate of amount required for Water.
men and animals.

Examination of water sources--microscopic, chemical.

Selection of sources. Plans and methods of supply in
hilly countries and plains.

Methods of purification of water, construction of filters,
tanks, wells, &c.

Arrangements for watering animals indispensable. Proper
construction of watering troughs.

Construction, management, distance, and position of camp Camp Kitchens.
kitchens. Position and distance of Slaughtering-places.
Latrines, Manure depôts, Stables, and Burial grounds.

- Huts. Huts. Materials for construction, stones, planks, panels, wattles. Best form and dimensions.
Preparation of ground. Drainage of site. Raising of foundations above surrounding levels. Utility of this precaution.
Ventilation, and best methods of effecting it. Means of keeping huts cool in hot weather.
Utility of limewash.
Protecting hut sides during cold weather. Good and bad methods of doing so, and their influence on health.
Dangers to health from excavated huts.
- Tents. Tents. Preparation and drainage of sites. The importance of this to health.
Methods of ventilating tents.
- Bivouacs, &c. Bivouacs, &c. Sanitary precautions required as to ground, shelter, fires, food, clothing, &c.
- Field Hospitals. Field hospitals. Selection and drainage of site and arrangement of Hospital.
Hospital huts, their structure, preparation of sites, draining, ventilating, warming, limewashing.
Marquees, their construction, and means of ventilation.
Flooring for huts, marquees, and tents. Boards, punned earth, stones, &c.
Method of paving vicinity of tents and huts.
Field Hospital kitchens. Various forms of construction. Cooking utensils.
- Rations. Rations. Sources of supply. Those of every country should be known. Composition of rations on physiological grounds, according to the supplies available.
Changes in rations required to prevent disease.
Practical details of rations in conformity with the work, duties, climate, season, &c., to which the soldier is exposed.
- Drinks. Drinks. Catalogues of those in use in different countries. Their wholesomeness or unwholesomeness. Drinks best suited for soldiers in foreign countries and climates.
Practical tests of their adulteration.
- Canteens. Canteens. Their regulation and good sanitary state necessary to health.
Intemperance. Means of suppressing it in camps. Disease, mortality, and loss of efficiency arising from it.
- Clothing and Equipments. Military clothing and equipments. Their material parts, make, and adaptation to duties by day and night, in different weather, climates, and seasons.
- Invaliding. Invaliding. Examination of invalids. Diseases and accidents influencing health and efficiency. Effect of invaliding on the strength of armies.
- Burial grounds. Burial of the dead in armies. Position of burial grounds, their regulation.
- Troop and sick transport. Troop and sick transports and Hospital ships. Requisites for health, ventilation, cleanliness, deodorising substances, pumping out bilge water. Cubic and superficial area re-

quired. Equipments. Sanitary duties of Medical Officers on board ship.

Practical instructions on hygiène.

Exercises in examination of recruits.

Exercises in the examination into the qualities of various articles of food, drink, and clothing.

Exercises in the examination into the sanitary condition of country and town districts, buildings, barracks, hospitals, &c., for the purpose of pointing out defects and their remedies.

Exercises in making sanitary inspections and drawing up sanitary reports by Medical and Sanitary Officers.

Exercises on the sanitary regulations for the Army, explanation of their objects, and their application to the prevention of disease.

Exercises on the means of mitigating or preventing epidemic disease in armies.

Exercises in keeping statistical accounts of disease and mortality, with special reference to questions in Army hygiène. Statistical forms and reports in use.*

Exercises on medical topography, showing its sanitary relations.

Exercises on the preparation of camping ground.

Exercises in the routine of sanitary inspections and reports by Inspectors and Deputy Inspectors.

Drawings and Models of improved barracks, hospitals, tents, marquees, huts, kitchens, transport ships, drainage and ventilating arrangements, also illustrations of various temporary sanitary expedients, &c.

Poisons.

Poisons.

Signs of poisoning. Medico-legal inquiries on these points. Detection of poisoning.

Remedies.

Precautions in the use of poisonous substances.

Signs of death.

Death from violence. To detect the manner of it.

II.

CLINICAL AND MILITARY MEDICINE.

THIS Course will consist of two parts:—

1. Clinical Instruction in the Hospital.

2. Systematic Lectures on the Diseases of Armies.

The Professor will give instruction at the bedside, more especially on the more prevalent diseases of armies. He will exercise the pupils in drawing up accurate histories of cases of disease under treatment. He will examine and practise them in the various methods of diagnosis, by auscul-

CLINICAL AND
MILITARY
MEDICINE.

* Whenever possible, the Student might be allowed to acquire practice in keeping Statistics in the Statistical Branch of the Army Medical Department.

tation, the use of the microscope, and by the application of chemical tests. He will also deliver clinical lectures on the cases under treatment. In this part of the course the Professor will have an opportunity of illustrating the management of Hospitals, as to cleanliness, ventilation, nursing, &c., and of indicating the Hospital diets in different diseases and stages of disease, and during convalescence.

The method of drawing up Hospital Reports will also be properly taught in this part of the course.

The Professor will deliver lectures on the following subjects:—

History of Military Medicine, with notices of the more important writers on the subject.

The general character, habits, and duties of the soldier, and the influence of these in modifying his diseases.

General view of the diseases to which soldiers are most liable, from exposure, fatigue, intemperance, &c., in different climates.

General view of the medical history and management of yellow fever, remittents and intermittents, dysentery, cholera, scorbutus, phthisis pulmonalis, venereal diseases, &c., in different countries and climates.

Lectures and Clinical Instructions on Mental Diseases.

Medical history of the more remarkable epidemics which have occurred in the British and other armies.

Nature and medical management of the more prevalent diseases in different climates, in the British Colonies, and other places where our troops may be stationed, as in the Mediterranean, West Indies, coast of Africa, East Indies, &c.

Beneficial effects of change of air and of climate on invalids, and in convalescence from disease or wounds, and in deteriorated health arising from long residence in unhealthy climates. Attention to this of great importance in maintaining the efficiency of troops serving in tropical climates.

Advantages of frequent medical inspection of troops, particularly in unhealthy stations, with the view of detecting the commencement of disease.

Hospital regulations, books, and forms.

Regulations regarding sick certificates, invaliding, and recruiting.

Instruction in Hospital duties.

III.

CLINICAL AND MILITARY SURGERY.

This course, like the preceding, will be of a special and practical character, and will have constant reference to Clinical instruction in the Surgical wards of the Hospital. The instructions and lectures will comprehend the following subjects:—

1. History of Military Surgery. Measures adopted by the Military Powers of Europe to improve the Art of Military Surgery.

2. Surgical Anatomy, including Regional Anatomy, with special reference to wounds. Operations on the Dead Body, especially such operations as are required in the field.

3. Lectures on Inflammation; its immediate importance and constant relations to Military Surgery, as a morbid and curative Agent.

4. Burns and Scalds. Ulcers.

5. Hospital Gangrene.

6. Wounds, Gunshot, Incised, Punctured, Lacerated, Wounds of Arteries and Nerves. Traumatic Aneurisms.

7. Tetanus.

8. Wounds of the Head, Face and Neck, Spine, Thorax, Abdomen, Extremities. Fractures and Luxations. Poisoned Wounds.

9. Amputations.

10. Dental Surgery.

11. Ophthalmia.

12. Syphilis, Gonorrhœa, Gonorrhœal Ophthalmia, Gonorrhœal Rheumatism, Strictures of the Urethra.

13. Dracunculus, or Guinea-worm.

14. Farunculus, or Boil.

15. Feigned and Factitious Diseases.

16. Application of Bandages and Splints.

17. Transport of Sick and Wounded; fitting up of transports, and hospital ships; the use and selection of Ambulances. Proportion of sick and wounded in Armies.

18. The Examination and Selection of Recruits.

19. The Examination and classifying of Invalids.

20. Proportion of Medical and Surgical means and Appliances to Corps and Divisions in different Climates.

21. Surgical arrangements on landing on an enemy's Coast: on taking the Field; and during and after a general action. Surgical arrangements with an advancing Army; with an Army in retreat; with a besieging Force. Trench duties and arrangements.

22. Surgical arrangements within a besieged town or fort.

IV.

LECTURES AND DEMONSTRATIONS IN PATHOLOGY AND MORBID ANATOMY.

Lectures and demonstrations on Morbid Anatomy, illustrated by specimens, selected from the Museum, and aided by accessory methods of observation, such as carefully recorded Clinical Histories of Cases of the more important and severe Diseases prevalent at the Military Stations abroad.

PATHOLOGY
AND MORBID
ANATOMY.

1. A series of specimens to illustrate the Morbid Anatomy of Dysentery as it has existed in the East and West Indies; in the Peninsula; in the Crimea.

2. Specimens illustrating the Morbid Anatomy of the Liver in connection with Dysentery.

3. Specimens illustrative of the lesions which occur in Fevers, similarly considered, especially of Typhus Fevers, and of Malarial, Littoral, or Paludal Fevers.

4. Specimens illustrative of the Morbid Anatomy of Cholera.

5. Specimens to illustrate Scorbutic States and Types of Disease.

6. Specimens illustrating the nature of Parasites and of Parasitic Diseases, such as Tape-worm, Guinea-worm, and the like.

7. Specimens illustrating the general Morbid Anatomy of Parts, independent of Zymotic Diseases.

8. Specimens illustrative of the Morbid Anatomy of Wounds and Injuries.

9. These topics might be also illustrated by recent specimens of Morbid Anatomy, obtained from post-mortem examinations of patients dying in the Hospital.

Practical instruction will also be conveyed—

1. By the opening of dead bodies, when special instruction will be given as to (*a*) how post-mortem examinations are to be made; (*b*) how the viscera are to be examined; (*c*) and how the results of disease-processes are to be distinguished from post-mortem changes and other pseudo-morbid appearances.

2. In this practical work of manual labour, dexterity would be acquired by the student. Special instruction will be given to each individual as to how he should use the various means and instruments of research by which departures from the state of health may be appreciated, as for example, the determination of the absolute and specific weights of the solid organs, membranes, and fluids in health and in disease, the determination of the bulk and capacity of parts and cavities.

3. A full course of practical instruction in the use of the Microscope, and its application in determining the nature of diseased conditions.

This Microscopic Course will embrace instruction—

(1) In the arrangement of the instrument, and how it is to be manipulated.

(2) In the various methods of examining objects by it, of drawing the objects seen, and of measuring the dimensions of the objects examined.

(3) In the examination of tissues and morbid products, and the application of chemical agents for their analysis under the microscope.

(4) Instruction in the preservation of microscopic objects.

One lecture, or series of lessons, weekly, till the topics are exhausted, will be sufficient for the microscopical instruction.

Practical instruction will also be given as to how specimens illustrative of Disease, Comparative Anatomy, or Natural History, are to be preserved, and sent home from abroad.

V.

LECTURES AND PRACTICAL INSTRUCTIONS ON APPLIED CHEMISTRY.

The Course of Chemistry and Pharmacy given in the Medical School must necessarily take for granted that the Students, having already obtained Medical Diplomas or Degrees, are sufficiently acquainted with Chemistry, except in the special applications of that science to practical Army purposes, and for the illustration of questions of hygiene. This will exclude all merely elementary instruction, and confine the business of the course to the following classes of subjects:—

Pressure of the atmosphere at different elevations. Barometer, mode of construction and observation, use of the barometer for the measurement of heights. The Atmosphere.

Temperature of the atmosphere, proper construction of thermometers, correct method of observation of wet and dry bulb thermometers, maximum and minimum thermometers.

Determination of the elasticity and amount of vapour in the exterior atmosphere and in a confined atmosphere.

Hygrometers, their theory and practical uses. Determination of the relative moisture of the air over marshes and over dry regions.

The temperature of the boiling-point of water, and its correspondence with the diminished pressure of the air.

Formulae for ascertaining altitudes by the boiling-point of water.

The preceding includes generally meteorological observations, to which may be added theories of dew, showers, rain, snow, hail, &c., effect of heat on air, laws of expansion, laws of the winds and hurricanes.

Chemical constitution of the atmosphere, normal constituents. Organic matter and gases containing carbon and hydrogen (?). Proof of the presence of these elements and compounds in the air, modes of demonstrating its composition. Analysis and synthesis of common air, its composition in different localities—temperate and tropical. Its chemical constitution.

Effects of respiration of animals on confined atmospheres. Analysis of large masses of air. Chemical nature of impurities in the air of private houses and hospitals, excess of Atmospheric impurities.

carbonic acid, and deficiency of oxygen: organic matter, and moisture deposited on walls, furniture, &c., of unventilated rooms. Composition of the air in the holds of ships, and of sewer atmospheres. Chemical modes of disinfecting impure atmospheres by chlorine-sulphurous acid, chloride of zinc, and other metallic preparations. Theory of their action.

Water.

Composition of pure water. Physical characters of water, density, colour, odour, compressibility. The Gulf Stream. Influence of currents on climate. Ice, its distribution in the Arctic and Antarctic regions. Effect of accumulations of ice on climate. Vapour, important influence of the vapour in the atmosphere on climate.

Chemistry of the gases.

Chemical constituents of water. Distilled water required in certain diseases, best and most economical modes of distilling water, distilled water required in certain localities where alone brackish water exists naturally. Filtration of water, different kinds of filters. Removal of colour from water. Analyses of waters. Sources of the contamination of water. Selection of the supply of water for ships, camps, and barracks. Mineral waters, nature and analyses. Connexion with geological strata. Hot waters, their connexion with volcanic action.

Chemical characters of *Chlorine* as a disinfecting agent.

Carbonic acid. Carburetted hydrogen or marsh gas. Olefiant gas. Coal gas, modes of analyses and detection of impurities injurious to health. Methods of estimating deleterious effect of these illuminating agents on the atmosphere of rooms and wards. Mode of removing impure products of combustion in connection with ventilation.

Phosphoretted Hydrogen, its occurrence in marshes. Sulphurous and sulphuric acids, existence of the former in the atmosphere of cities as a product of the combustion of coal and gas, likewise in the air of rooms and hospitals.

Sulphuretted Hydrogen in the air of sewers and impure atmospheres.

Chemistry of non-metallic bodies.

Vegetable and animal charcoal. Wood and mineral coal. Modes of analysis. Methods of preparing charcoal for disinfecting, and other purposes.

Phosphorus and its compounds. Diseases produced by the manufacture of lucifer matches.

Sulphur and compounds. Geological derivation in connection with volcanic regions, originally evolved as sulphuretted hydrogen from volcanoes and hot springs.

The following division will be studied by constant testing and analysis in the laboratory.

Chemistry of metals.

ALKALINE BASES.—Natural alkaline salts distributed over the Globe. Modes of discrimination and analyses. Manufacture of gunpowder. Mode of detecting adulterations.

ALKALINE EARTHS.—*Barium* and compounds. Pharmaceutical preparations.

Strontium and compounds.—Application to fireworks.

Calcium and compounds.—Lime as a mortar, and as a decomposer of organic substances and disinfecter. Sulphate of lime for casts.

Chloride of Lime or *Bleaching Powder*.—Manufacture of as a disinfecting agent. Mode of testing its value.

Magnesium and compounds.—Hydrate of carbonate, sulphate of magnesia, or Epsom salt, manufacture of. Pharmaceutical preparations. Detection of adulterations.

EARTHS. *Aluminium* compounds.—Alum manufacture. Value of as a preservative of cotton from combustion; as a medicine. Pharmaceutical preparations.

Iron, manganese, nickel, cobalt, copper, silver, chromium, uranium, molybdenum. Mode of testing and analyzing the ores. Geological source of the ores. Copper as a poison. Antidotes. Pharmaceutical preparations of these metals. Mode of detecting adulterations by tests and microscope.

Zinc, lead, tin, bismuth, mercury, antimony, arsenic. Ores and their geological sources. Modes of testing and analyzing ores of these metals. Pharmaceutical preparations. Adulterations and processes for detection. Detection of these metals as poisons by tests and microscope. Gold, platinum, palladium, rhodium, &c. Ores, and their geological sources. Testing, analyzing, and assaying. Pharmaceutical preparations. Adulterations and discovery of impurities.

Analysis and detection of mineral poisons.

Mineral
Poisons.
Organic
Chemistry.

Substances forming the main portions of Plants and Trees.—Cellulose and ligneous matter.

Substances found in the Cells of Plants.—Starch, flour. Modes of Analysis. Detection of adulterations. Potatoes. Diseases affecting them. Yams. Bread fruit. Cassava. Inferiority of arrowroot, sago, &c. as food. Laws regulating the proper constitution of well balanced food.

Substances found in the Juices of Plants.—Gums. Pectic acid. Sugars. Changes produced in sugar by heat, vegetation, fermentation. Spirits, use of as food and medicine. Different species in various countries. Brandy, rum, gin, whiskey, &c. Wines, mode of manufacture of different kinds. Determination of purity. Application in health and disease. Vinegar, acetic acid, oxalic acid, uses in medicine.

Vegetable Alkaloids and Allies.—Quinine, morphine, strychnine, caffeine, theine, coneine, nicotine, &c. Tests and adulterations.

Colouring matters, and plants supplying them.

Acids secreted by Plants.—Tartaric acid, citric, malic, tannic, meconic, konic, &c. Fatty substances employed as oils for burning and for candles. Soap making. Wax. Essential oils.

Analysis and detection of vegetable poisons.

Vegetable
Poisons.
Animal
Chemistry.

Study of the changes produced in food by cooking. Convenient means of cooking. Stoves. Application of gas and oil lamps to cooking utensils. Application of steam to cook-

ing. Secondary digestion or conversion of food into blood. Analysis of the blood, composition in different diseases. Analysis of the various parts of the body, bones, &c., nutrition or deposition of solid matter from the blood. Flesh, or muscle, composed of fibre and fat essentially. Mode of judging of the wholesomeness and diseased state of animal food. Meat of dead animals, slipped calves, measley pork, raw ham containing entozoa capable of communicating disease.

Rations and
Diets.
Secretions.

Chemical constituents of rations and hospital diets.

Secretions.—Milk, analysis of adulterations, milk of different animals, value in disease.

Urine.—Analysis in the healthy and diseased states, detection of sugar and albumen, indigo, crystalline deposits. Use of the microscope. Analysis of gravel and calculi, and consideration of the scientific treatment of urinary diseases, from a proper acquaintance with the chemistry of the animal system. Urine as a manure, mode of preserving its ammonia in barracks and stables.

Nature of the skin and skin diseases. Chemical composition of skin. Mucous membranes. Importance of preserving the skin clean by sponging, brushing, bathing—hot and cold. Function of the skin. Exhalation of gas and vapour.

Respiration by the lungs a source of impurity to the air. Relation of the intestinal surface to the respiratory or pulmonary surface to be properly observed in reference to health. Chemistry of the diseases of the lungs. Tubercles. Modified albumen. General relations of the system to the external world. Animal heat.

The Professor of Chemistry will also give practical instruction in the extemporaneous preparation of medicinal substances, and in dispensing.

Section III.

RULES FOR THE EXAMINATION OF ASSISTANT-SURGEONS PREVIOUS TO PROMOTION.

This examination is intended as a test for promotion, and EXAMINATIONS FOR PROMOTION. may be taken at any time after the Assistant-Surgeon has served five or more years.

When Assistant-Surgeons have served the requisite time they will be examined in the following manner:—

A series of printed questions, prepared by the Examining Board, will be sealed and sent by the Director-General to the Principal Medical Officers of Stations where Assistant-Surgeons may be eligible for examination. It will be the duty of the Principal Medical Officer of the Station to deliver these sealed questions to the Assistant-Surgeons, and to see that they are answered without the assistance of books, notes, or communication with any other person. The answers are to be signed, and delivered sealed, to the Principal Medical Officer, who is to send them unopened to the Director-General, together with a certificate from the Surgeon of the Regiment, or other superior Medical Officer, that the Assistant-Surgeon has availed himself of every opportunity of practising surgical operations on the dead body.*

The Assistant-Surgeon will also be required to transmit, together with his answers to the Director-General, a Medico-Topographical account of the Station where he may happen to be at the time, or of some other Station where he may have been resident sufficiently long to enable him to collect the necessary information for such a report. Failing this, he will send a Medico-Statistical Report of his Regiment for a period of at least twelve months.

If the Examining Board is satisfied with the replies to the questions, and the Director-General is satisfied with the certificates and with the Medico-Topographical or Statistical Report, the Assistant Surgeon will be held qualified for promotion.

The Assistant-Surgeon will thus be subjected to three separate examinations within the first ten years of his service,

* The Assistant-Surgeon may see this Certificate before it is sent to the Director-General.

each examination having a definite object. The FIRST, to ascertain, previous to his admission into the service as a Candidate, his scientific and professional education, and to test his acquirements in the various branches of professional knowledge. The SECOND, after having passed through a Course of special instruction in the Army Medical School, to test his knowledge of the special duties of an Army Medical Officer; and the THIRD, previous to his promotion, to ascertain that he has kept pace with the progress of Medical Science.

SIDNEY HERBERT.

War Office, October 17, 1859.

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